

PHASE ERROR DETECTOR USING I/Q INTERFERENCE CANCELLATION

ABSTRACT:

A method is presented for estimating a phase error for first (r_I) and second (r_Q) orthogonal signal components spread respectively by different first c_I and second c_Q spreading codes. A cross-despread value I_dQ and/or Q_dI is determined by despread one signal component with the spreading codes associated with the other signal component (r_I with c_Q or r_Q with c_I). In parallel, the same signal component is also despread with its associated spreading code to determine an estimated data symbol for that component. An interference of Q into I or I into Q is calculated and multiplied by the estimated data symbol, and subtracted from the cross-despread value to achieve an estimate of phase error. Preferably, both cross-despread values are obtained, normalized to a common data rate, scaled to maximize signal to noise ratio, and combined into one phase error estimate. A phase error detector includes despreaders, multipliers, and adders to determine the cross-despread value and subtract the interference from it.